Section 05, 510(k) Summary

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Device Name:

Trade name – **Quidel Molecular Influenza A + B Assay**
Classification name – Respiratory viral panel multiplex nucleic acid assay
Product Code – OZE
Regulation – 21 CFR 866.3980

Legally marketed devices to which equivalence is claimed:

Gen-Probe Prodesse ProFlu+ (k092500)

The ProFlu™+ Assay is a multiplex Real-Time PCR (RT-PCR) *in vitro* diagnostic test for the rapid and qualitative detection and discrimination of Influenza A Virus, Influenza B Virus, and Respiratory Syncytial Virus (RSV) nucleic acids isolated and purified from nasopharyngeal (NP) swab specimens obtained from symptomatic patients. This test is intended for use to aid in the differential diagnosis of Influenza A, Influenza B and RSV viral infections in humans and is not intended to detect Influenza C.

Negative results do not preclude influenza or RSV virus infection and should not be used as the sole basis for treatment or other management

decisions. It is recommended that negative RSV results be confirmed by culture.

Performance characteristics for Influenza A Virus were established when Influenza A/H3 and A/H1 were the predominant Influenza A viruses in circulation. When other Influenza A viruses are emerging, performance characteristics may vary. If infection with a novel Influenza A virus is suspected based on current clinical and epidemiological screening criteria recommended by public health authorities, specimens should be collected with appropriate infection control precautions for novel virulent Influenza viruses and sent to state or local health department for testing. Viral culture should not be attempted in these cases unless a BSL 3+ facility is available to receive and culture specimens.

Intended Use:

The Quidel® Molecular Influenza A+B assay is a multiplex Real Time RT-PCR assay for the *in vitro* qualitative detection and differentiation of influenza A and influenza B viral RNA in nasal and nasopharyngeal swabs from patients with signs and symptoms of respiratory infection. This test is intended for use as an aid in the differential diagnosis of influenza A and influenza B viral infections in humans in conjunction with clinical and epidemiological risk factors. The assay does not detect the presence of influenza C virus.

Negative results do not preclude influenza virus infection and should not be used as the sole basis for diagnosis, treatment or other patient management decisions.

Performance characteristics for influenza A were established during the 2010 to 2011 influenza season when influenza A/H3 and 2009 H1N1 influenza were the predominant influenza A viruses in circulation. When other influenza A viruses are emerging, performance characteristics may vary.

If infection with a novel influenza A virus is suspected based on current clinical and epidemiological screening criteria recommended by public health authorities, specimens should be collected with appropriate infection control precautions for novel virulent Influenza viruses and sent to state or local health department for testing. Viral culture should not be attempted in these cases unless a BSL 3+ facility is available to receive and culture specimens.

Device Description:

The Quidel Molecular Influenza A+B Assay detects viral RNA that have been extracted from a patient sample using the NucliSENS® easyMAG® automated

extraction platform. A multiplex RT-PCR reaction is carried out under optimized conditions in a single tube generating amplicons for each of the target viruses present in the sample. This reaction is performed utilizing the Cepheid SmartCycler® II platform. Identification of influenza A occurs by the use of target specific primers and a fluorescent- labeled probe that hybridizes to a conserved influenza A sequence within the matrix protein gene. Identification of influenza B occurs by the use of target specific primers and fluorescent-labeled probes that will hybridize to a conserved influenza B sequence within the neuraminidase gene.

The following is a summary of the procedure:

1. **Sample Collection:** Obtain nasal swabs and nasopharyngeal swabs specimens using standard techniques from symptomatic patients. These specimens are transported, stored, and processed according to established laboratory procedures.

2. **Nucleic Acid Extraction:** Extract Nucleic Acids from the specimens with the NucliSENS easyMAG System following the manufacturer's instructions using the appropriate reagents.

   Prior to the extraction procedure add 20 µL of the Process Control (PRC) to each 180 µL aliquot of specimen. The PRC serves to monitor inhibitors in the extracted specimen, assures that adequate amplification has taken place and that nucleic acid extraction was sufficient.

3. **Rehydration of Master Mix:** Rehydrate the lyophilized Master Mix using 135µL of Rehydration Solution. The Master Mix contains oligonucleotide primers, fluorophore and quencher-labeled probes targeting highly conserved regions of the influenza A and influenza B viruses as well as the process control sequence. The primers are complementary to highly specific and conserved regions in the genome of these viruses. The probes are dual labeled with a reporter dye attached to the 5'end and a quencher attached to the 3' end. The rehydrated Master Mix is sufficient for eight reactions.

4. **Nucleic Acid Amplification and Detection: Add** 15 µL of the rehydrated Master Mix to each reaction tube. 5µL of extracted nucleic acids (specimen with PRC) is then added to the tube. Then place the tube into the Cepheid SmartCycler® II.

   Once the reaction tubes are added to the instrument, the assay protocol is initiated. This protocol initiates reverse transcription of the RNA targets generating complementary DNA, and the subsequent amplification of the target amplicons occurs. The Quidel Molecular Influenza A+B assay is

based on TaqMan® chemistry, and uses an enzyme with reverse transcriptase, DNA polymerase, and 5'-3' exonuclease activities. During DNA amplification, this enzyme cleaves the probe bound to the complementary DNA sequence, separating the quencher dye from the reporter dye. This step generates an increase in fluorescent signal upon excitation by a light source of the appropriate wavelength. With each cycle, additional dye molecules are separated from their quenchers resulting in additional signal. If sufficient fluorescence is achieved by 45 cycles, the sample is reported as positive for the detected nucleic acid.

Device Comparison

The Quidel Molecular Influenza A+B assay was compared to Prodesse ProFlu+ ("Comparator Device"). The characteristics of Quidel Molecular Influenza A+B assay ("Subject Device") and Prodesse ProFlu+ ("Predicate Device") are described in Table 5.1, below:

Table 5.1: Device Comparison

Item	**Subject Device** Quidel Molecular Influenza A+B Assay	**Comparator Device** Prodesse ProFlu+
Intended Use	The Quidel® Influenza A and B virus RT-PCR Kit is a multiplex Real Time RT-PCR assay for the *in vitro* qualitative detection and identification of influenza A and influenza B viral RNA in nasal and nasopharyngeal swabs from patients with signs and symptoms of respiratory infection,. This test is intended for use as an aid in the differential diagnosis of influenza A and influenza B viral infections in humans in conjunction with clinical and epidemiological risk factors. The assay does not detect the presence of influenza C virus. Negative results do not preclude influenza virus	The ProFlu™+ Assay is a multiplex Real-Time PCR (RT-PCR) *in vitro* diagnostic test for the rapid and qualitative detection and discrimination of Influenza A Virus, Influenza B Virus, and Respiratory Syncytial Virus (RSV) nucleic acids isolated and purified from nasopharyngeal (NP) swab specimens obtained from symptomatic patients. This test is intended for use to aid in the differential diagnosis of Influenza A, Influenza B and RSV viral infections in humans and is not intended to detect Influenza C. Negative results do not preclude influenza or RSV

Table 5.1: Device Comparison

Item	**Subject Device** Quidel Molecular Influenza A+B Assay	**Comparator Device** Prodesse ProFlu+
	infection and should not be used as the sole basis for diagnosis, treatment or other patient management decisions. Performance characteristics for influenza A were established during the 2010 to 2011 influenza season when influenza A/H3 and 2009 H1N1 influenza were the predominant influenza A viruses in circulation. When other influenza A viruses are emerging, performance characteristics may vary. If infection with a novel influenza A virus is suspected based on current clinical and epidemiological screening criteria recommended by public health authorities, specimens should be collected with appropriate infection control precautions for novel virulent influenza viruses and sent to state or local health departments for testing. Viral culture should not be attempted in these cases unless a BSL3+ facility is available to receive and culture specimens.	virus infection and should not be used as the sole basis for treatment or other management decisions. It is recommended that negative RSV results be confirmed by culture. Performance characteristics for Influenza A Virus were established when Influenza A/H3 and A/H1 were the predominant Influenza A viruses in circulation. When other Influenza A viruses are emerging, performance characteristics may vary. If infection with a novel Influenza A virus is suspected based on current clinical and epidemiological screening criteria recommended by public health authorities, specimens should be collected with appropriate infection control precautions for novel virulent Influenza viruses and sent to state or local health department for testing. Viral culture should not be attempted in these cases unless a BSL 3+ facility is available to receive and culture specimens.
Assay Target	Influenza A virus, influenza B virus	Influenza A virus, influenza B virus, respiratory syncytial virus

Table 5.1: Device Comparison

Item	**Subject Device** Quidel Molecular Influenza A+B Assay	**Comparator Device** Prodesse ProFlu+
Sample Types	nasal swab and nasopharyngeal swab	nasopharyngeal swab
Extraction Methods	bioMérieux easyMAG Automated Magnetic Extraction Reagents	Roche MagNA Pure LC Total Nucleic Acid Isolation Kit or the bioMérieux easyMAG Automated Magnetic Extraction Reagents
Assay Methodology	PCR-based system for detecting the presence or absence of viral RNA in clinical specimens	PCR-based system for detecting the presence or absence of viral RNA in clinical specimens
Detection Techniques	Multiplex assay using different reporter dyes for each target	Multiplex assay using different reporter dyes for each target
Viral Targets	Influenza A: Matrix Gene; Influenza B: Neuraminidase Gene	Influenza A: Matrix Gene; Influenza B: Non-structural NS1 and NS2
LoD	The analytical sensitivity (limit of detection or LoD) of the Quidel Molecular Influenza A+B assay was determined using quantified ($TCID_{50}$/mL) cultures of 3 influenza A strains (1 H1N1, 1 2009H1N1 and 1 H3N2), 3 influenza B strains, serially diluted in negative nasopharyngeal matrix. Each dilution was extracted in replicates of 20 per concentration of virus using the NucliSENS easyMAG System and tested on Cepheid SmartCycler® II. Analytical sensitivity (LoD), as defined as the lowest	The analytical sensitivity (limit of detection or LoD) of the ProFlu+ Assay was determined using quantified ($TCID_{50}$/mL) cultures of 4 Influenza A (2 H1N1 and 2 H3N2), 2 Influenza B, 2 Respiratory Syncytial Virus Type A, and 2 Respiratory Syncytial Virus Type B strains serially diluted in nasopharyngeal clinical matrix. Each viral strain was extracted using the Roche MagNA Pure LC instrument and tested in replicates of 20 per concentration of virus. Analytical sensitivity (LoD),

Table 5.1: **Device Comparison**		
Item	**Subject Device** Quidel Molecular Influenza A+B Assay	**Comparator Device** Prodesse ProFlu+
	concentration at which 95% of all replicates tested positive, ranged from 10^1 to 10^0 $TCID_{50}$/mL.	as defined as the lowest concentration at which 95% of all replicates tested positive, ranged from 10^2 to 10^{-1} $TCID_{50}$/mL.

Analytical Performance:

Precision/Reproducibility:

The reproducibility of the Quidel Molecular Influenza A and B assay was evaluated at 3 laboratory sites. Reproducibility was assessed using a panel of 4 simulated samples that include medium (5x LoD) and low (2x LoD), high negative (0.3x LoD) influenza A (A/Mexico/4108/2009), influenza B (B/Florida/04/2006) and negative samples. Panels and controls were tested at each site by 2 operators for 5 days (triplicate testing x 2 operators x 5 days x 3 sites = 90 results per level for each virus). The LoD values are based on the values obtained in the LoD study. The panels and controls were extracted using the bioMérieux easyMAG system and tested on the Cepheid SmartCycler II.

Table 5.2: Reproducibility Results

Panel Member ID	Site 1			Site 2			Site 3			Total Results
	Results	AVE Ct	%CV	Results	AVE Ct	%CV	Results	AVE Ct	%CV	
Influenza A High Negative 0.3x LoD	3/30 (3 positive results)	44.27	1.2	4/30 (4 positive results)	43.45	4.5	2/30 (2 positive results)	42.65	0.50	9/90
Influenza A Low Positive 2x LoD	30/30	37.72	2.7	30/30	38.05	3.8	30/30	37.40	4.5	90/90
Influenza A Med Positive 5x LoD	30/30	35.36	1.9	30/30	36.05	3.3	30/30	34.95	1.6	90/90
Influenza A Negative	0/30	N/A	N/A	0/30	N/A	N/A	0/30	N/A	N/A	0/90
Influenza B High Negative 0.3x LoD	0/30	N/A	N/A	1/30 (1 positive	39.9	N/A	4/30 (4 positive results)	42.43	3.2	4/90

Table 5.2: Reproducibility Results										
Panel Member ID	Site 1			Site 2			Site 3			Total Results
	Results	AVE Ct	%CV	Results	AVE Ct	%CV	Results	AVE Ct	%CV	
				result)						
Influenza B Low Positive 2x LoD	30/30	35.42	1.14	30/30	36.06	3.1	30/30	34.86	3.6	90/90
Influenza B Med Positive 5x LoD	30/30	33.46	1.2	30/30	33.86	1.6	30/30	33.01	1.3	90/90
Influenza B Negative	0/30	N/A	N/A	0/30	N/A	N/A	0/30	N/A	N/A	0/90
Influenza A Positive Control	30/30	29.19	1.2	30/30	29.47	1.9	30/30	29.25	1.5	90/90
Influenza B Positive Control	30/30	27.76	1.1	30/30	28.05	2.7	30/30	27.57	1.5	90/90
Negative Control	0/30	N/A	N/A	0/30	N/A	N/A	0/30	N/A	N/A	0/90

The data from the combined sites indicates that the Quidel Molecular assay generates reproducible results for both influenza A and influenza B viruses when tested with the Cepheid SmartCycler II.

Limit of Detection

The analytical sensitivity (limit of detection or LoD) of the Quidel Molecular Influenza A+B assay was determined using quantified ($TCID_{50}$/mL) cultures of three influenza A strains (1 H1N1, 1 2009H1N1 and 1 H3N2) and three influenza B strains, serially diluted in negative nasopharyngeal matrix. Each dilution was extracted using the NucliSENS easyMAG System in replicates of 20 per concentration of virus and tested on the Cepheid SmartCycler II platform. Analytical sensitivity (LoD) is defined as the lowest concentration at which 95% of all replicates tested positive.

Table 5.3: Final $TCID_{50}$ LoD	
Strain	**Final LOD ($TCID_{50}$/mL)**
A1/Mal/302/54	7.00E+00
A/Mexico/4108/2009	2.40E+01
A/Victoria/3/75	3.10E+01
B/Florida/04/2006	6.00E+00
B/RCHIN 8/05	1.80E+00
B/Malaysia/25/06/04	1.30E+00

Analytical reactivity (inclusivity)

The reactivity of the Quidel Molecular Influenza A+B assay was evaluated against multiple strains of influenza A, and influenza B viruses. The clinical panel consisted of 10 Influenza A subtype H1N1, 2 Influenza A subtype 2009H1N1, 8 Influenza A subtype H3N2, 2 Influenza A subtype H5N1, 13 Influenza B, strains. An additional panel of non-clinical restricted isolates was also tested. Each panel member was extracted using the NucliSens easyMAG instrument and tested in triplicate.

The Quidel Molecular Influenza A+B assay detected 100% of the influenza A (38/38) and influenza B strains (15/15) at 10^2 to 10^3 $TCID_{50}$ levels including novel, pandemic and avian influenza A strains and recent circulating influenza B strains.

Table 5.4: Clinical Panel Influenza A viruses

Subtype	Strain	$TCID_{50}$		
			A	B
2009 H1N1	H1N1 A/California/07/2009	1.45E+02	Positive	Negative
H1N1	A/New Caledonia/20/1999	1.12E+02	Positive	Negative
H1N1	A/New Jersey/8/76	3.80E+02	Positive	Negative
H1N1	A/PR/8/34	5.89E+02	Positive	Negative
H1N1	A/NWS/33	NA	Positive	Negative
H1N1	A/Denver/1/57	1.26E+02	Positive	Negative
H1N1	A/FM/1/47	3.80E+02	Positive	Negative
2009 H1N1	A/Mexico/4108/2009	1.40E+02	Positive	Negative
H1N1	A1/Mal/302/54	4.19E+02	Positive	Negative
H1N1	A/Taiwan/42/06	3.39E+02	Positive	Negative
H1N1	A/Brisbane/59/07	7.24E+01	Positive	Negative
H1N1	A/Solomon Islands/3/06	1.41E+01	Positive	Negative
H3N2	A/Hong Kong/8/68	1.15E+02	Positive	Negative
H3N2	A/Wisconsin/67/2005	7.24E+02	Positive	Negative
H3N2	A/Aichi/2/68	4.17E+02	Positive	Negative

Table 5.4: Clinical Panel Influenza A viruses				
Subtype	**Strain**	**$TCID_{50}$**		
			A	**B**
H3N2	A/Port Chalmers/1/73	4.57E+02	Positive	Negative
H3N2	A/Perth/16/2009	9.83E+02	Positive	Negative
H3N2	A/Uruguay/7/16/2007	1.03E+02	Positive	Negative
H3N2	A/Victoria/3/75	2.19E+02	Positive	Negative
H3N2	A/Brisbane/10/07	4.17E+02	Positive	Negative

Table 5.5: Clinical Panel Influenza B viruses			
Strain	**$TCID_{50}$**		
		A	**B**
B/HongKong/5/72	6.67E+02	Negative	Positive
B/Panama/45/90	1.02E+02	Negative	Positive
B/Florida/02/2006	3.16E+02	Negative	Positive
B/Florida/04/2006	3.80E+02	Negative	Positive
B/Florida/07/2004	1.26E+02	Negative	Positive
B/Malaysia/25/06/04	3.41E+02	Negative	Positive
B/Maryland/1/59	1.15E+02	Negative	Positive
B/Allen/45	4.17E+02	Negative	Positive
B/Taiwan/2/62	1.51E+02	Negative	Positive
B/Russia/69	2.19E+02	Negative	Positive
B/Mass/3/66	1.38E+02	Negative	Positive
B/Lee/40	1.95E+02	Negative	Positive
B/GL/1739/54	6.30E+02	Negative	Positive

Table 5.6: Non-clinical Restricted viruses				
Subtype	**Strain**	**$TCID_{50}$**		
			A	**B**
	A/WI/629-9/2008	2.00E+02	Positive	Negative
H3N2	A/WI/629-2/2008 (H3N2)	2.00E+02	Positive	Negative
H1N1	A/WI/629-S7(D02473)/2009 (H1N1pdm)	2.00E+02	Positive	Negative
H1N1	A/WI/629-S5 (D02312)/2009 (H1N1pdm)	2.00E+02	Positive	Negative
H2N2	A/Mallard/NY/6750/78 (H2N2)	2.00E+02	Positive	Negative
H7N3	A/Chicken/NJ/15086-3/94 (H7N3)	2.00E+02	Positive	Negative

Table 5.6: Non-clinical Restricted viruses				
Subtype	**Strain**	**$TCID_{50}$**		
			A	**B**
H9N2	A/Chicken/NJ/12220/97 (H9N2)	2.00E+02	Positive	Negative
H4N8	A/Mallard/OH/338/86 (H4N8)	2.00E+02	Positive	Negative
H6N2	A/Chicken/CA/431/00 (H6N2)	2.00E+02	Positive	Negative
H8N4	A/Blue Winged Teal/LA/B174/86 (H8N4)	2.00E+02	Positive	Negative
H5N1	A/Anhui/01/2005(H5N1)-PR8-IBCDC-RG5	2.00E+02	Positive	Negative
H10N7	A/GWT/LA/169GW/88 (H10N7)	2.00E+02	Positive	Negative
H11N9	A/Chicken/NJ/15906-9/96 (H11N9)	2.00E+02	Positive	Negative
H12N5	A/Duck/LA/188D/87 (H12N5)	2.00E+02	Positive	Negative
H13N6	A/Gull/MD/704/77 (H13N6)	2.00E+02	Positive	Negative
H14N5	A/Mallard/GurjevRussia/262/82 (H14N5)	2.00E+02	Positive	Negative
H15N9	A/Shearwater/Australia/2576/79 (H15N9)	2.00E+02	Positive	Negative
H16N3	A/Shorebird/DE/172/2006(H16N3)	2.00E+02	Positive	Negative

Analytical specificity (cross-reactivity)

The analytical specificity of the Quidel Molecular Influenza A+B assay was evaluated by testing a panel consisting of 26 viral, 24 bacterial, and 1 yeast strain representing common respiratory pathogens or flora commonly present in nasopharynx. Bacteria and yeast were tested at concentrations of 10^5 to 10^{10} CFU/mL. Viruses were tested at concentrations of 10^3 to 10^6 $TCID_{50}$/mL. Samples were extracted using the NucliSens easyMAG instrument and tested in triplicate. Analytical specificity of the Quidel Molecular influenza A+B assay was 100%.

Table 5.7: Quidel Molecular influenza A+B assay Cross-reactivity Data			
Organism ID	Final Conc.	Influenza A Result	Influenza B Result
hMPV A1	3.70E+04	Negative	Negative
hMPV B1	2.37E+04	Negative	Negative
RSV Long	4.40E+04	Negative	Negative
RSV Washington	1.75E+03	Negative	Negative
Adenovirus 1/Adenoid 71	5.67E+04	Negative	Negative
Coronavirus 229E	1.70E+06	Negative	Negative
Coronavirus OC43	1.67E+06	Negative	Negative
Coxsackievirus B4	2.43E+06	Negative	Negative
Coxsackievirus B5/10/2006	2.28E+06	Negative	Negative
Cytomegalovirus	8.76E+05	Negative	Negative
Echovirus 7	5.38E+08	Negative	Negative
Echovirus 9	1.50E+06	Negative	Negative
Echovirus 6	1.05E+08	Negative	Negative
Echovirus 11	1.50E+05	Negative	Negative
Enterovirus 71	2.68E+03	Negative	Negative
Enterovirus 70	1.66E+05	Negative	Negative
Epstein Barr Virus	5,000cp/mL	Negative	Negative
HSV Type 1 Mac Inytre strain	1.95E+06	Negative	Negative
HSV Type 2 G strain	3.67E+06	Negative	Negative
Rubeola	3.78E+05	Negative	Negative
Mumps virus	8.43E+04	Negative	Negative
Parainfluenza Type 1	2.50E+05	Negative	Negative
Parainfluenza Type 2	2.20E+04	Negative	Negative
Parainfluenza Type 3	9.10E+05	Negative	Negative
Parainfluenza Type 4	9.57E+06	Negative	Negative
Varicella Zoster Virus	7.50E+02	Negative	Negative
Bordetella pertussis	1.04E+07	Negative	Negative
Bordetella bronchiseptica	2.55E+07	Negative	Negative
Chlamydia trachomatis	2.10E+05	Negative	Negative
Legionella pneumophila	2.05E+08	Negative	Negative
Mycobacterium intracellulare	6.90E+08	Negative	Negative
Mycobacterium tuberculosis	6.60E+07	Negative	Negative
Mycobacterium avium	1.36E+10	Negative	Negative
Haemophilus influenzae	5.90E+07	Negative	Negative

Table 5.7: Quidel Molecular influenza A+B assay Cross-reactivity Data			
Organism ID	Final Conc.	Influenza A Result	Influenza B Result
Pseudomonas aeruginosa	5.15E+07	Negative	Negative
Proteus vulgaris	2.65E+08	Negative	Negative
Proteus mirabilis	2.75E+07	Negative	Negative
Neisseria gonorrhoeae	2.15E+07	Negative	Negative
Neisseria menigitidis	1.85E+08	Negative	Negative
Neisseria mucosa	1.85E+08	Negative	Negative
Klebsiella pneumoniae	3.30E+07	Negative	Negative
Escherichia coli	6.80E+07	Negative	Negative
Moraxella catarrhalis	5.85E+07	Negative	Negative
Corynebacterium diptheriae	6.0E+05	Negative	Negative
Lactobacillus plantarum	1.03E+08	Negative	Negative
Streptococcus pneumoniae	4.5E+07	Negative	Negative
Streptococcus pyogenes	2.05E+08	Negative	Negative
Streptococcus salivarius	2.50E+06	Negative	Negative
Staphylococcus epidermidis	2.6E+07	Negative	Negative
Staphylococcus aureus	5.15E+08	Negative	Negative
Candida albicans	1.07E+06	Negative	Negative

Clinical Performance:

Prospective Clinical Study

Performance characteristics of the Quidel Molecular Influenza A+B assay using the Cepheid SmartCycler® II instrument were established during a prospective study during the 2010-2011 respiratory virus season (January to March 2011). Samples used for this study were fresh nasal (427) and nasopharyngeal (352) swab specimens that were collected for routine influenza testing at thirteen sites across the United States. A single specimen was collected per patient and tested within 72-hours of collection at one central location.

A comparator method (a high performance FDA Cleared Influenza A and B molecular test) was used in the evaluation of the Quidel Molecular Influenza A+B assay.

Seven hundred and seventy-nine (779) fresh specimens (427 nasal swabs and 352 nasopharyngeal swabs) were tested by both the subject and comparator device for influenza A and influenza B virus viral RNA. Twelve of these specimens were invalid on initial testing with the subject device (1.5%). Re-testing of the specimens according to the Interpretation algorithm described above also yielded invalid results. Twenty-three specimens were invalid on initial and repeat testing (as per the device's PI) on the comparator device (3.0%). Nine specimens were invalid in both devices, therefore, a total of twenty-six invalid specimens have been removed from additional analysis. The table below details the results for the remaining 753 specimens.

Table 5.8: Influenza A

Fresh nasal and nasopharyngeal swabs (N=753)	**Comparator: FDA Cleared RT-PCR device**		
Quidel Molecular	Positive	Negative	Total
Positive	157	8*	165
Negative	0	588	588
Total	157	596	753
			95% CI
Positive Percent Agreement	157/157	100%	97.7% to 100%
Negative Percent Agreement	588/596	98.7%	97.4% to 99.4%

*Eight specimens were negative by FDA Cleared RT-PCR device but positive for influenza A by sequence analysis.

Table 5.9: Influenza B

Fresh nasal and nasopharyngeal swabs (N=753)	**Comparator: FDA Cleared RT-PCR device**		
Quidel Molecular	Positive	Negative	Total
Positive	123	28*	151
Negative	2	600	602
Total	125	628	753
			95% CI
Positive Percent Agreement	123/125	98.4%	94.3% to 99.8%
Negative Percent Agreement	600/628	95.5%	93.6% to 97.0%

*Twenty-six specimens were negative by FDA Cleared RT-PCR device but positive for influenza B by sequence analysis. Two specimens were negative by FDA Cleared RT-PCR device but negative for influenza B by sequence analysis.

The prospective clinical study had a dual infection rate for Influenza A and Influenza B of 2.4% (18/753) using the Quidel Molecular Influenza A + B Assay. Three of these dual infections were concordant with the FDA Cleared RT-PCR device comparator assay. Three of these dual infections were discordant with the Influenza A results from the FDA Cleared RT-PCR device comparator assay. Twelve of these dual infections were discordant with the Influenza B results from the FDA Cleared RT-PCR device comparator assay.

Retrospective Study

Performance of the Quidel Molecular Influenza A+B assay using the Cepheid SmartCycler® II instrument were also evaluated during a retrospective study of frozen specimens collected during the 2010-2011 respiratory virus season (January to March of 2011). Samples tested in this study were frozen nasopharyngeal (356) swab specimens that were collected for routine influenza testing.

For this study the comparator method was high performance FDA Cleared influenza A and B molecular device.

Three hundred fifty six (356) frozen nasopharyngeal swabs were tested by both the subject and comparator devices for influenza A and influenza B virus viral RNA. Two of these specimens were invalid on initial testing with the subject device (0.6%). Re-testing of the specimens according to the Interpretation algorithm described above also yielded invalid results. Two specimens were invalid on initial and repeat testing (as per the device's PI) on the comparator device (0.6%). The invalid specimens were removed from performance analyses. The table below details the results for the remaining 352 specimens.

Table 5.10: Influenza A

Frozen nasopharyngeal swab (N=352)	**Comparator: FDA Cleared RT-PCR device**		
Quidel Molecular	Positive	Negative	Total
Positive	37	0	37
Negative	0	315	315
Total	37	315	352
			95% CI
Positive Percent Agreement	37/37	100%	90.5% to 100%
Negative Percent Agreement	315/315	100%	98.8% to 100%

Table 5.11: Influenza B			
Frozen nasopharyngeal swab (N=352)	**Comparator: FDA Cleared RT-PCR device**		
Quidel Molecular	Positive	Negative	Total
Positive	37	5*	42
Negative	1	309	310
Total	38	314	352
			95% CI
Positive Percent Agreement	37/38	97.4%	86.2% to 99.9%
Negative Percent Agreement	309/314	98.4%	96.3% to 99.5%

*Five specimens were negative by FDA Cleared RT-PCR device but positive for influenza B by sequence analysis.

CONCLUSIONS

Quidel Molecular Influenza A + B Assay using the Cepheid SmartCycler® II instrument yielded good positive and negative percent agreement when compared to a high performance FDA Cleared Influenza A and B molecular test.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
10903 New Hampshire Avenue
Silver Spring, MD 20993

Quidel Corp.
Ronald H. Lollar
Sr. Director, Clinical and Quality Affairs
10165 McKellar Ct.
San Diego, CA 92121

MAR 1 5 2012

Re: K113777
Trade/Device Name: Quidel® Molecular Influenza A+B Assay
Regulation Number: 21 CFR 866.3980
Regulation Name: Respiratory viral panel multiplex nucleic acid assay
Regulatory Class: Class II
Product Code: OZE, OOI
Dated: December 16, 2011
Received: December 21, 2011

Dear Mr. Lollar:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into class II (Special Controls), it may be subject to such additional controls. Existing major regulations affecting your device can be found in Title 21, Code of Federal Regulations (CFR), Parts 800 to 895. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); and good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820). This letter

will allow you to begin marketing your device as described in your Section 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Parts 801 and 809), please contact the Office of *In Vitro* Diagnostic Device Evaluation and Safety at (301) 796-5450. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/cdrh/industry/support/index.html.

Sincerely yours,

Sally A. Hojvat, M. Sc., Ph.D.
Director
Division of Microbiology Devices
Office of *In Vitro* Diagnostic Device
Evaluation and Safety
Center for Devices and Radiological Health

Enclosure

510(k) Number k113777:

Device Name: Quidel Molecular Influenza A+B Assay

Indication for Use:

The Quidel® Molecular Influenza A+B assay is a multiplex Real Time RT-PCR assay for the *in vitro* qualitative detection and differentiation of influenza A and influenza B viral RNA in nasal and nasopharyngeal swabs from patients with signs and symptoms of respiratory infection. This test is intended for use as an aid in the differential diagnosis of influenza A and influenza B viral infections in humans in conjunction with clinical and epidemiological risk factors. The assay does not detect the presence of influenza C virus.

Negative results do not preclude influenza virus infection and should not be used as the sole basis for diagnosis, treatment or other patient management decisions.

Performance characteristics for influenza A were established during the 2010 to 2011 influenza season when influenza A/H3 and 2009 H1N1 influenza were the predominant influenza A viruses in circulation. When other influenza A viruses are emerging, performance characteristics may vary.

If infection with a novel influenza A virus is suspected based on current clinical and epidemiological screening criteria recommended by public health authorities, specimens should be collected with appropriate infection control precautions for novel virulent Influenza viruses and sent to state or local health department for testing. Viral culture should not be attempted in these cases unless a BSL 3+ facility is available to receive and culture specimens.

Prescription Use		Over-The-Counter Use _____
X	AND/OR	(21 CFR 801 Subpart C)
(Part 21 CFR 801 Subpart D)		

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE IF NEEDED

Concurrence of CDRH, Office of *In Vitro* Diagnostic Devices Evaluation and Safety (OIVD)

Tamara Feldblyum

Division Sign-Off

Office of In Vitro Diagnostic
Device Evaluation and Safety

510(k) K113777